

REMARKS

Claims 1-5 are pending and under consideration.

In the Final Office Action of July 3, 2007, claim 1-5 were rejected. Claims 1 and 5 were rejected as containing terms lacking antecedent basis. Claims 1-5 were rejected under 35 USC 112 as allegedly not setting forth what applicants regard as their invention. Claims 1,2 , 3 and 5 were rejected as obvious in view of Oesten et al. and Spitler. Claim 4 was rejected as obvious in view of Oesten et al., Spitler and Naruaka et al.

In response, claims 1 and 5 have been amended. Support for the changes can be found in the first full paragraph at page 7 of the specification, and throughout the specification.

Regarding the informality and the rejection of the claims under 35 USC 112, the claims have been amended to more clearly set forth that the anode active material comprises particles, each of which is a layered structure, one layer being an inner particle of a first compound oxide of lithium and nickel, the other layer being a coating layer which is formed on at least parts of the surface of the inner particle. This is fully supported throughout the specification, as indicated by the examiner's understanding of the invention in the office action.

Regarding the rejections of the claims as obvious, the rejections are traversed.

As noted above, the claims require that each particle of the anode active material have a layered structure wherein the particle as at least a coating layer formed on at least parts of the surface of an inner particle of a compound oxide of lithium and nickel. The coating layer comprises a compound oxide of lithium and titanium selected from the group consisting of $\text{Li}_4\text{Ti}_5\text{O}_{12}$, Li_2TiO_3 , $\text{Li}_2\text{Ti}_3\text{O}_{7a}$ and $\text{Li}_4\text{Ti}_{4.90}\text{Mn}_{0.10}\text{O}_{12}$.

The specification notes the types of active material particles mentioned in Oesten et al at pages 5-6 of the specification. These particles do not exhibit the good high temperature characteristics of the presently claimed active material.

The office action relies on Spitler for the alleged suggestion to replace the metal oxide or mixture of alkali metal compounds and metal oxides coating layer of Oesten et al. with the $\text{Li}_4\text{Ti}_5\text{O}_{12}$ material of Spitler. This is traversed.

This technological area requires much research to discover the benefits and detriments of the use of different materials. Spitler notes in paragraphs [0007] to [0009] that even the type of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ determines its performance. Spitler notes various types of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ that do not perform well, i.e., suffer from poor Li insertion and extraction. Thus, for this reason alone, there is no suggestion to simply substitute $\text{Li}_4\text{Ti}_5\text{O}_{12}$ for the Oesten et al coating.

Further, Spitler is concerned with a process using a crystalline phase spinel compound of the formula $\text{Li}_4\text{Ti}_5\text{O}_{12}$. To produce the compound the process uses a step of preparing a mixture of an organo-lithium compound selected from lithium alcoholates with an organo-titanium compound selected from a group of titanate acid esters, in a liquid medium. The process also includes a step of hydrolizing the mixtures.

In contrast, in the process described in the present application, a crystalline phase is not used. Instead, materials are sintered, milled and mechano-fused to coat the particles with the coating materials under compressive and shear stresses.

Given that these processes are very different and produce very different coatings, one of ordinary skill in the art would not look to Spitler for teachings on how to effect the claimed coatings.

Yet further, in Spitler, the $\text{Li}_4\text{Ti}_5\text{O}_{12}$ is the entire material used to make the electrode. The $\text{Li}_4\text{Ti}_5\text{O}_{12}$ is not used as a coating material, much less a coating material for individual particles. For this additional reason, there is no suggestion to substitute in the Spitler material as a coating for Li oxide nickel compound particles. The only basis set forth in the Office Action is derived from impermissible hindsight reasoning, even assuming, the Spitler material could serve as a coating material.

As set forth in the specification, applicants discovered that by using the recited coating materials to coat the individual particles of the active material, they obtained batteries with enhanced high temperature and storage characteristics. The key is to coat the particles such that electrolyte in contact therewith does not decompose and the coating material does not hinder or decrease the Li conductivity of the active material.

Claim 2 sets forth a highly preferred ratio between the compound of the coating layer and the compound of the inner particle. This ratio similar is not suggested or taught in the prior art.

For the foregoing reasons it is submitted that claims 1-5 are patentable and that the application is in condition for allowance. Notice to that effect is requested.

Respectfully submitted,

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